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ABSTRACT

Teacher's perceptions of their experiences in teaching small classes or with a full-time teacher's aide are discussed in this report. The study reported was part of Tennessee's Project STAR: a 4-year, longitudinal demonstration policy study. Analyses were conducted on interviews with 86 teachers of small second grade classes, 54 teachers of second grade classes of regular size, and 71 teachers from second grade classes of regular size who were assisted by a full-time teacher aide. Teachers were from inner-city, suburban, urban, and rural schools. Discussion focuses on differences in: (1) amount of content covered; (2) amount of instructional time on task; (2) monitoring of pupils' work; (4) ability to match level of instruction to the ability of individual pupils; (5) pacing of instruction; (6) degree of active student-teacher academic interaction; (7) individual attention to students; (8) classroom social climate; (9) demands on available time; and (9) aspects of the use of the full-time teacher aide. Project STAR teacher interviews revealed distinct and consistent perceptions and explanations that clearly illustrated that having fewer children or an adult assistant in the classroom contributed to significant improvements in the quality of teachers' worklife, the classroom learning environment, and children's experiences in schools. (RH)

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A PROJECT STAR PROGRESS REPORT

Class Size and Life in Second Grade Classrooms

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October, 1989

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Class Size and Life in Second Grade Classrooms

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This paper reports teacher's perceptions of their experiences teaching small classes, or teaching with a full time teacher's aide. More specifically, this paper reports analysis based on interviews with 791 Tennessee K-2 teachers exploring their perceptions of the effects of reduced class size and reduced pupil teacher ratio on the quality of their worklife, the teaching/learning environment, and the quality of the classroom experience for young children in the primary grades. This is a progress report that presents preliminary results of just one specific portion of a landmark state wide policy study of the effects of reduced class size and reduced pupil teacher ratio on children in the primary grades. First however, the purpose and evaluation design of the project are outlined. Next the methodology and analysis procedures for the specific data set to be reported in this paper are reviewed. Finally, preliminary summary findings from the 211 second grade teacher interviews are reported.

Background

The Tennessee Legislature authorized a 12 million dollar, four year, longitudinal demonstration policy study to consider the effects of class size on pupils in primary (K-3) grades. The Student/Teacher Achievement Ratio project (Project STAR) began in August, 1985 with representatives from Memphis State University, Tennessee State University, University of Tennessee-Knoxville, Vanderbilt University, the State Department of Education, the State Board of Education and the State Superintendent's Association working in a consortium to conduct and monitor the project.

Project STAR Design

There were 42 districts and 79 individual schools representing rural, urban, suburban, and inner city populations across Tennessee which became initial participants in Project STAR. A within-school design was selected in which each participating school had at least one each of the three class types involved in the study. The class type, a primary variable for analysis, included a small class defined as one teacher with approximately 15 students (13-17), a regular class defined as one teacher with approximately 24 students (22-25) and a regular class with a full time teacher aide. Once the districts and schools were selected (voluntary participation), pupils were randomly assigned to the three conditions. Teachers were also randomly assigned to classes.

The within-school design and random assignment of pupils and teachers represents a real strength of this four-year, longitudinal demonstration. To further reinforce the project's design, some comparison schools (from STAR districts but not participating in Project STAR) were selected and pupils were given the same tests as the project schools. In addition, independent test monitors were employed in each project school during test administration times, to assure standardized testing conditions. In sum, strengths of this project include: random assignment of children to classes, random assignment of teachers to classes, four year longitudinal design, large sample size, wide range of sample characteristics, examination of process as well as product variables, and inclusion of teacher training and cost-benefit analysis components.

A research team from the four universities collected a wide variety of data including, pupil academic achievement, pupil academic self-concept and motivation, attendance, and retention; demographic information regarding school systems, schools, principals, teachers, and aides; and various process data regarding parent-teacher interaction, teacher grouping practices, perceived teacher problems, and teacher and aide use of time. In order to obtain qualitative insights into quantitative data generated from standardized tests and questionnaires, exit interviews were conducted at the end of each year with each teacher in the project. The results of teacher exit interviews conducted in 1988 with 211 second grade teachers, are the subject of this progress report.

Teacher Exit Interview Data Source and Procedures

While extensively, though somewhat inconclusively studied, the question of class size is generally answered in terms of "smaller is better." However, since most class size research can be described in terms of the "black box" research paradigm, there exists only a hazy understanding of what changes occur in classrooms when class size is reduced or when teacher/pupil ratio is reduced by use of full-time teacher aides. While difficult to obtain and analyze, probing interviews with teachers can provide important explanation of how their teaching differed with fewer students or with a full time aide. These insights will bring more meaning to Project STAR data obtained through questionnaires, logs, observations and standardized instruments.

This paper reports analysis of interviews conducted in May 1988 with 86 small class second grade teachers, 54 regular class second grade teachers, and 71 regular/aide class second grade teachers. Teachers interviewed were drawn from all geographic regions of the state and represented inner-city, suburban, urban, and rural schools. Interviews were conducted by research team members from each of the four university consortium members. In sum, 211 second grade teachers participated in related structured, year-end interviews.

The interview protocols were the data source for this present report. A three stage iterative analysis was performed on the first year (kindergarten) data. In the first stage the protocols were examined to identify and define common themes. In the second stage

protocols were categorized along the dimensions of those themes. In the third stage a random set of responses, which had been set aside at the outset of the analysis, was used to check the reliability of the theme categories and the coding process. The second year (first grade) interview schedule was derived from fourteen themes identified from the kindergarten interviews. Each theme of the first grade teacher interviews was analyzed using the same three stage iterative procedure. The third year (second grade) interview schedule was developed from significant themes which emerged from the previous two years, and from variables identified from research literature on instruction.

In sum, the second grade exit interview questions were built on the perceptions, descriptions, and explanations of 580 Project STAR kindergarten and first grade teachers. Kindergarten teachers' responses to open ended questions provided evidence of clear dimensions of differences between teaching in regular sized classes, and small classes or regular size classes with a full time aide. These dimensions of difference provided the content and structure of the first grade teacher interview questions. Responses from the first grade teachers helped establish validity of the kindergarten teachers responses, and provided a more fine-grained view of teacher thinking and behavior when teaching with a 1:15 or 2:25 teacher pupil ratio. Open ended questions to first grade teachers added no new dimensions to those identified by kindertgarten teachers. Generally first grade Project STAR teacher interview responses added more depth and more definition to the experiential snapshot first provided by the kindergarten teachers.

Because the first grade teacher exit interviews provided no additional dimensions the second grade interview schedule was modified. Several areas addressed in kindergarten and first grade teacher responses were dropped, and in their place were questions based on current research literature on classroom instruction. Decisions regarding what areas to drop from the interview schedule were based on the amount of new information about that area provided by first grade teachers, and on developmental and programmatic differences between kindergarten and the upper primary grade classrooms.

Reglar Size Class Teacher Responses

A strong feature of the Project STAR design mandated random assignment of children to classes. At the same time this design feature mandated changes in traditional patterns and practices of grouping children in classes within a grade level. The result of this policy was that many second grade teachers who had been accustomed to teaching in classes heterogeneously grouped by ability, now were faced with teaching classes where children were homogeneously grouped by ability. Thus, for example, teachers who for years had been teaching high ability children, now had to deal with some middle and some low ability children as well. Project STAR's random assignment procedures might have caused these teachers, for the first time, to teach classes which contained low ability Chapter I students. Participation in Project STAR also meant that schools who normally grouped for reading across all first grade classes had to change their procedure and group within class

only. Also, for some regular class teachers, participation in Project STAR meant somewhat smaller classes than normal 25 or so students. As one teacher remarked, "It is amazing what the reduction to 21 children makes, I wish it could be like this all of the time!"

Since in the kindergarten and first grade exit interviews regular class teachers described few differences, the second grade regular class teachers were only asked to describe any differences between this year and previous comparable years of teaching. The responses of the second grade regular class teachers were consistent with those of the kindergarten and first grade regular class teachers and are described above. The remainder of this paper presents analysis of small class teacher and regular/aide class teacher responses to each of the ten questions outlined above.

Small and Regular/Aide Class Teacher Responses

The primary purpose of the 1988 second grade Teacher Exit Interviews was to elicit descriptions of differences, if any, that teachers perceived regarding the following dimensions: (a) amount of content covered, (b) amount of instructional time on task, (c) monitoring student work, (d) ability to match level of instruction to the ability of individual pupils, (e) pacing of instruction, (f) degree of active student-teacher academic interaction, (g) individual attention to students, (h) classroom social climate, (i) demands on available teacher time, and (j) use of full time teacher aide. These ten dimensions emerged from 1986 exit interviews with teachers (Achilles, et al, 1988), 1987 exit interviews with Project STAR first grade teachers (Johnston, 1988), and instruction research literature.

DIFFERENCES IN AMOUNT OF CONTENT COVERED

Teachers were asked "If the amount of content in your class has been different this year as compared to last year, then describe how it has been different." As was the case with each of the ten questions, they were also asked how having fewer children or a full-time aide explains these differences. Finally, their responses were probed for whether or not children had more or different opportunities to learn content this year.

Small Class Teachers and Amount of Content Covered

Small class teachers, as a group, overwhelming indicated that they had been able to cover more content than in past years. First, this difference was discussed in terms of covering more of the required objectives, particularly in reading and math. Small class teachers reported that more children were on or above grade level than in past years. For example, several teachers indicated that they had been able to complete all of the basal reading books specified for the second grade, noting that had this rarely ever happened in

past years. Second, small class teachers described that they were able to cover the required material in "more depth" than in the past, that they were able to include more details about content they were teaching.

Explanations for differences in amount of content covered. Small class teachers primarily explained that they were able to cover more material because they could give children more individual attention, and that they were more knowledgeable about each child's level. Teachers explained they were able to give slow learners more individual attention to keep them up with the rest of the group. Teachers indicated they had more accurate and immediate knowledge of each child's progress, and therefore could provide individualized instruction as necessary. They explained that rather than having to check papers at night, they could monitor the child's work during the instructional episode and could reteach right on the spot. The ability to provide immediate feedback was reported by many small class teachers, as was the ability to provide immediate remedial instruction; exclaimed one teacher, "Instant feedback, that's the greatest part!" Teachers noted there was more interaction between the teacher and pupils, that children could ask more questions and could express themselves more.

Opportunities to learn content. This difference was discussed in terms of more time for projects and extra content in science,social studies, creative writing, and pleasure reading. In particular, it appears that because teachers were confident that children were learning the required basic reading and math, they felt they could devote more time to other school subjects. Science and social studies were most often described as receiving more attention. Teachers reported using more "hands on" activities and project, and more opportunities for children to use "manipulative" materials. In general small class teachers perceived that there was more opportunity for enrichment activities, particularly in art and creative writing. Several teachers reported taking more field trips and having more outside resource speakers come into the classroom to talk to children.

As has been found in exit interviews with kindergarten and first grade small class teachers, the second grade small class teachers were able to cover more content that they had in the past. This difference was expressed in terms of covering more of the required reading and math objectives than they normally covered; and it was expressed in terms of covering more content in science, social studies, and language arts. Greater use was made of enrichment activities and projects. The children in these second grade classes were more likely to have an opportunity to learn using developmentally appropriate manipulative materials, and hands-on learning experiences. Small class teachers attribute the faster rate of pupil progress and the increased amount of pupil progress to being able to provide immediate feedback to students, and to being able to provide a significantly greater degree of individualized instruction based on a more thorough and accessible knowledge of each child's ability level.

Regular/Aide Class Teachers and Amount of Content Covered

Most regular/aide class teachers reported that they had covered more content this year, several teachers noting for example, that they had finished every required textbook. Many reported that they had covered more material due to the aide. Teachers noted that they had had helped duplicate, collate, staple, and set up materials for class; could help give immediate feedback to students; assisted with clerical duties; helped monitor pupil behavior; supervise learning centers; and helped grade papers. Many noted that the aide was able to move about the room and help keep pupils on task. Other noted that they aide handled a lot of the extra paperwork, including grading papers.

Several teachers noted that having the aide meant that they were able to provide children with many more hands on projects such as cooking, and concrete learning materials such as would be necessary for measuring. The aide was employed to supervise these projects and provided necessary assistance in producing and monitoring use of the materials. As was the case in small classes, regular/aide class teachers provided their students with increased opportunities for science and social studies learning. In general teachers reported that having an aide meant that children received many "extras" and more "indepth" learning experiences. Several teachers explained that they were able to complete more of the enrichment activities suggested in the teacher's manual of the reading and language arts texts.

Many teachers talked about covering more content in terms increased individual attention as in the case of the teacher who explained, "When you are by yourself you have to do a lot of whole group stuff, but with an aide you can notice more and 'departmentalize' to meet the needs you've noticed." Regular/aide class teachers most often employed the aide to work with slower students while the teacher worked with the high achievers. However, some reported that teacher and aide traded off working with the advanced group. Others used the aide to do the reteaching, resulting in more immediate follow-up with children who were experiencing a problem. Many of the regular/aide class teachers related that they used the aide in one-to-one teaching, again resulting in increased individual attention to the learning needs of specific children.

DIFFERENCES IN AMOUNT OF INSTRUCTIONAL TIME ON TASK

Teachers were asked: "If the amount of instructional time on task has been different in your class this year as compared to last year, then describe how it has been different." Their responses were probed for perceptions regarding the source of the extra time, and how the extra time was used to affect opportunities for pupils to learn.

Small Class Teachers and Time on Task

Most small class teachers responded to this question with general descriptions of time use in the classroom, rather than the more specific notion of time on task. Some small class teachers indicated that there was considerably more time on task than there had been in previous comparable years of teaching. Teachers explained this difference was due to their ability to monitor children's on-task behavior. With fewer children it was easier to keep an eye on children, and to remind them if they were not on task. Increased "withitness" was a strong theme in small class teacher responses to this question. They knew what what going on in the classroom, could spot potential problems and nip them in the bud. As one teacher explained, "fewer disruptions means more time for instruction."

Many small class teachers explained that they were able to work more individually with each child and could tailor instruction to the specific needs of each pupil. As was the case with the question regarding amount of material covered, teachers responded to the question about instructional time in terms of having more time to spend working with each child. The theme of more time for individual attention to each pupil is strong in teachers' perceptions of amount and rate of material covered and time spent in instruction.

Teachers reported that the increased amount of available time came from having to spend less time on transitions, housekeeping, and paperwork clerical tasks. Also, less time was spent on discipline and on getting and keeping children's attention during lessons. With fewer children in the class there were fewer distractions, both for the teacher and the students. When discussing reading groups, small class teachers reported that they were better able to make use of the allotted instructional time because there was less time that the group had to wait for a slower child to grasp the instructions, find his place, or answer a question. Teachers indicated that with fewer children in each reading group they could make sure that children were paying attention and following along. Several teachers noted that with the smaller reading groups they spent much less time on explaining instructions, that children were able to go ahead and work independently.

Regular/Aide Class Teachers and Time on Task

Many teachers reported that in general they had more time than in past years of teaching. Most explained the increase in time in terms of their aide noting that the aide: prepared materials, did reteaching and explained directions, worked with individual students who were having problems, assisted with messy art activities, creative writing projects, handled clerical responsibilities, sheltered the teacher from interruptions from students with questions, monitored the class and kept pupils on task, and was responsible for supplemental instruction. Teachers primarily reported that having an aide provided them more time on task because the aide took care of non-teaching tasks.

In particular, many teachers described how the aide was of great help in grading pupil papers and accomplishing administrative chores leaving the teacher free to work with children and to engage in planning. Reported one teacher, "With the aide taking care of most of the paper work, I was able to spend most of the time teaching." Others explained how there more time on task was due to having an aide who could help monitor children's behavior and redirect children when they went off task. Still others explained that having the aide available to respond immediately to children's questions regarding their seatwork meant that while the teacher was working with small reading groups, the children in working in their seats did not have to wait and could continue with their work. Several teachers discussed more time on task in relation to being able to teach more science and social studies. These teachers pointed out that having the aide perform non-teaching duties and work with low achieving students resulted in more available time which could then be used for more science activities and social studies.

DIFFERENCES IN MONITORING PUPIL WORK

Teachers were asked "If monitoring student work in your class has been different this year as compared to last year, then describe how it has been different." Their responses were probed for how these differences might have contributed to new or increased opportunities for pupil learning.

Small Class Teachers and Monitoring Pupil Work

Most small class teachers responded that monitoring student work in the classroom had been much easier this year than in previous comparable years of teaching. The most common explanation offered was that because there were fewer children, papers could be checked on the spot and then each child could be given immediate feedback. Difficult content could be retaught to individuals or small "ad hoc" groups as needed. Similarly, with fewer children in the classroom teachers were able to more closely monitor children's work during the act of instruction, so that monitoring and reteaching were simultaneous. As one teacher explained, "I can almost see every child's work by standing in one spot." Several teachers indicated that they used fewer written tests because they had more detailed knowledge of each child's progress based on daily work and individual interactions with each student; explained one teacher, "With only 15 students I can keep data in my head." In most cases small class teachers tied the faster, more frequent, and more individualized feedback to increased opportunities for immediate reteaching. These teachers also related improved monitoring to better ability to match instruction to the needs of above and below average students in the class. Several teachers noted that children who were having problems were more likely to ask questions and request help than in the past. Many teachers also explained that the improved monitoring was also connected to greater opportunities for enrichment activities for children.

Regular/Aide Class Teachers and Monitoring Pupil Work

Most regular/aide class teachers indicated that there were positive differences in monitoring student work and explained these differences in relation to having a full time aide. Many teachers reported that the aide graded student work or help grade the work which meant that errors and learning problems could be spotted more quickly. The presence of the aide was seen as allowing more immediate feedback and reteaching when problems were identified. The immediacy of feedback to pupils was a major strand in teacher responses to this question, one teacher explaining for example, "It took away waiting on the part of the student." As another teacher indicated, "Children can get help as soon as they need it because with the aide one adult is almost always available." Several teachers spoke about this difference in terms of monitoring, feedback, and reteaching could be twice as fast with the aide's assistance. Other teachers reported that with the aide's help students received more individual help than they would have if the teachers had been by themselves. Noted one teacher, "With the aide in the room. . . .we can keep up with what each student needs; we could be aware of extra needs and meet them." While most teachers responded to this question in terms of grading and giving feedback, several teachers also addressed the notion of monitoring from the perspective of keeping children on-task, and preventing problem behavior.

DIFFERENCES IN ABILITY TO MATCH LEVEL OF INSTRUCTION TO THE ABILITY OF INDIVIDUAL PUPILS

Teachers were asked, "If your ability to match the level of instruction to the ability of individual children has been different in your class this year as compared to last year, then describe how it has been different."

Small Class Teachers and Instruction/Ability Level Match

Many small class teachers reported that it was much easier to match their level of instruction to the ability of individual children than it had been in the past. Several teachers noted that the class was more homogeneous than any class in the past, so it was much easier to individualize. In contrast, others indicated that with fewer children it was easier to accommodate the wide range of abilities of pupils in their classes; as one teacher explained, "I am less willing to teach to the middle of the road, this is the biggest difference for me, I can do a better job of planning because I know their strengths and weaknesses." Others explained that it was easier because they had more time to help students individually. For example, one teacher explained that she individualized content less, that is she made assignments of the same level of difficulty, but then she gave extra individualized attention to low achievers until the learned it. Many small class teachers addressed the theme of more time for remedial instruction for pupils having difficulty, and more enrichment activities for those who had mastered the objectives and were ready to move on. As is the case with teacher responses to other questions regarding instruction,

the themes of increased time and increased individual attention were salient in small class teachers' descriptions of matching instruction to student's ability. In general small class teachers indicated that it was much easier to match the level of their instruction to the level of the student's ability. Their explanations for why this was easier related to having more detailed and accessible knowledge of pupil ability levels, and to having the time to provide immediate, individual attention to students.

Regular/Aide Class Teachers and Instruction/Ability Level Match

While some regular aide class teachers perceived there to have been no difference in their ability to match the level of instruction to the ability of individual children, most of regular/aide class teachers described differences and reported that these differences were due to the presence of a full time aide. Several strands emerged as teachers spoke about these differences. First, several teachers described an improved match as a result of the aide working one-to-one with students who were having difficulty learning. In related comments, other teachers described how they used the aide to work with small ad hoc groups of children having problems, or to work with the low achieving reading, math, and spelling groups. A second strand emerged as teachers described how the aide contributed to an improved instructional match through increased use of learning centers, enrichment activities. Teachers described how the aides worked to develop materials for use in the center, and how they monitored children's activities in the center. In a third strand, teachers described how the aide was used as a roving tutor to answer student questions who were engaged in assigned seatwork while the teacher was leading small reading groups. Fourth, teachers described how the presence of the aide to supervise and monitor the class allowed the teacher to work one-on-one or in small ad hoc groups with children who were experiencing difficulties. Fifth, teachers described how the presence of the aide provided more detailed knowledge of each child's ability level, thus allowing a more precise match of assignments and ability.

DIFFERENCES IN PACING OF INSTRUCTION

Teachers were asked: "If there has been a difference in the pacing of instruction between this year and last year, then describe how it has been different."

Small Class Teachers and Pacing of Instruction

Most small class teachers reported that pacing of instruction had been faster this year. Some teachers reported that they were able to more faster because there was more time for individual attention to catch up slower students, that is, they did not have to wait

for the slower students to finish. Others reported that they were able to move faster because their classes were generally more homogeneous and more high achieving that they were normally accustomed to.

When responding to this question several teachers reported that because they were able to complete required basic skills instruction faster, they had more time available for discussion, extension of concepts, attention to student self-esteem, and more divergent and non-teacher directed instructional activities. In particular, several teacher reported that they allowed children to do more sharing (discussion) during both small and whole group instruction.

In a related point, several teachers noted that their daily schedule was not as rigid, that they knew they would get everything done they needed to do. This meant for example, that there was more time to stop and look things up in the dictionary or encyclopedia; or that there was more time to spend on a subject of high interest. Teachers noted that there was a more relaxed atmosphere in the class. Several teachers reported, for example, that they could make teaching more fun, and that they could use games to reinforce basic skills content. Teachers reported that extra time for these activities resulted from not having to spend as much time on grading papers, record keeping, and paper work.

Regular/Aide Class Teachers and Pacing of Instruction

Most regular/aide class teachers indicated that there had been a difference in the pacing of their instruction, and most attributed this difference to having a full time aide in their classroom. The most common theme regarding this question was that pacing had been faster, some teachers explaining that the aide worked with slower students, others that the aide worked with advanced students in supplementary learning activities, and others described how the aide increased the pacing of instruction by preparing instructional materials for the teacher. One-to-one tutoring and remedial instruction were common activities aides performed. Teachers described how the aide was able to provide more individualized assistance for children who were having problems. Many teachers attributed the faster pace to the aides assistance with monitoring pupil progress and then providing more immediate feedback so that material was learned in less time. Several teachers noted that low achieving pupils learned faster because the aide could provide immediate reteaching of material with which students were having problems. Many teachers attributed the faster pacing to having the aide's assistance with grading papers and administrative paperwork. Some of the regular/aide class teachers described that the faster pacing allowed them to teach more science, social studies, and creative writing than they would have been able to if they had been in the classroom by themselves. In particular, teachers reported that the aide provided assistance in setting up materials for special projects, such as in science, and in cleaning up when children had finished. Several teachers responded to this in terms of "greater depth" of coverage. In part this notion of

greater depth of coverage may be due to teachers having to provide less busy work for the class while she worked with those who needed extra assistance. The presence of the aide meant that the students who had mastered the material could take advantaged of supplementary materials, and enrichment activities provided by the text book publishers.

DIFFERENCES IN DEGREE OF ACTIVE STUDENT-TEACHER ACADEMIC INTERACTION

Teachers were asked: "If the degree of active student-teacher academic interaction has been different this year as compared to last year, then describe how it has been different." Active student-teacher academic interaction was described as referring to formal or informal one-to-one or one-to-group verbal exchanges, such as questions and answers about a reading story, or explanations of how to regroup numbers.

Small Class Teachers and Student-Teacher Academic Interaction

Most small class teachers responded that there had been significant differences in the degree of active student-teacher academic interaction when compared to last year. Generally small class teachers described that class discussions were more frequent and that all children in the class tended to be involved in these discussions. Teachers reported that they employed more higher level thinking activities. Children were more able to get out of their seats and work on the chalkboard. Children were more likely to be able to read aloud in reading groups, and teachers were more likely to read stories out lout to the class. Teachers were better able to insure that all students got a turn, that no students were left out; reported one teacher, "No one got lost in shuffle."

Teachers observed that children had more opportunity to speak in class, and were more willing to do so. Several small class teachers observed that the children appeared to be less inhibited, less afraid of being wrong and that they volunteered to answer questions more often. Several teachers noted this was particularly the case in their low achieving reading group. In a related matter, several teachers reported that children were more willing to talk about themselves, and were more willing to share personal problems with the teacher on an individual basis. For example, one teacher related, "I can catch moments here and there and not squelch such efforts like I would with a large group."

Generally teachers perceived that they were able to spend more time actively engaged in teaching children. Teachers perceived that the increased opportunities for active student-teacher academic interaction was the result of having more time. They perceived the extra available time came from less grading, paper work, record keeping, transitions (lining up, bathroom, water fountain).

Regular/Aide Class Teachers and Student-Teacher Academic Interaction

Most regular/aide class teachers responded that the degree of active student-teacher academic instruction had been different this year when compared to past comparable years. Several themes emerged from their explanations. First, many teachers related that having two adults in the classroom meant that children could receive twice as much interaction as before ("Having the aide who heard the lesson meant that there were now two adults who could provide academic interaction."). Similarly, other teachers explained that children now received more one-to-one instruction, and more small group instruction because of the aide's assistance. Second, several teachers described that the presence of the aide meant that they were able to provide more personal attention to individual students, and came to know students better as individuals ("The children received more adult talk since there were two of us."). Some teachers explained that the instructional time spent with children was more "concentrated" because having the aide in the classroom meant that behavior was better and therefore the teacher could devote undivided attention to those children she was teaching.

Teachers explained that the increased time for interaction with each child came from the aide's assistance in preparing materials for instruction. Others reported that the increased time came from the aide taking primary responsibility for paperwork and non-teaching duties. Still others explained that the extra time came from the aide's help in grading papers and recording scores ("Because the aide checked papers I didn't have to rush through anything.").

DIFFERENCES IN INDIVIDUAL ATTENTION TO STUDENTS

Teachers were asked: "If your individual attention to students has been different this year as compared to last year, then describe how it has been different." Responses were probed regarding individual instruction (reinforcement and reteaching); social, personal, and non-academic attention to children; and sources and expenditures of time for individual attention.

Small Class Teachers and Individual Attention to Pupils

Several themes emerged when teachers described how their individual attention to students had been different this year. First, many teachers reported that there was generally more attention, conversations, and sharing with children in the classroom and on the playground. Teachers reported that there was more time to listen and more time to share. Teachers noted that they knew more about their students' problems, concerns, and activities outside of school. They reported that students appeared more willing to seek the teacher out to talk to them, that children appeared to feel more comfortable seeking the help the needed from the teacher.

Second, teachers were more specific when they reported that they had more time to know about childrens' home lives and personal problems. Teachers reported having more frequent personal conversations with each child in their class, and noted that many positive things were shared. They noted that having a better understanding of a child's life outside of school helped them be more effective teaching that child in school. For example, one teacher related, "I know more about these students. . . had time to concentrate on learning about their likes and dislikes and personal information. This had helped me plan activities that I feel will interest them." Teachers reported that they (and parents) noticed improvement in the self-concept of some children, and attributed this to the increased individual and personal attention they were able to provide.

Third, small class teachers reported that with fewer students they had more time to provide individual attention to each child regarding school work. This salient theme has emerged from small class teacher responses to all other questions.

Regular Class Teachers and Individual Attention to Pupils

Regular/aide class teachers were overwhelming in their response that there had been more individual attention to pupils as compared to past comparable years. Several themes emerged as they explained how the presence of a full time aide contributed to this difference. In general teachers reported that the aide allowed more time to provide individual attention. Learning proceeded at a faster rate, hence they did not feel as rushed. One theme that emerged was that children received more individual academic attention from their teacher and from the aide. Academic attention often took the form of one-to-one reteaching or enrichment activities. A second theme was that children received more emotional and social attention from the teacher and the aide. Several teachers reported that they were able to provide more "hugs, encouragement, and reinforcement" than in the past. The pace of the classroom was more relaxed and teachers commented that they were more relaxed and open to non-academic interactions with children. Teachers did not feel as rushed because the aide was there to handle matters if necessary. Many teachers explained that with two adults in the classroom it was possible for someone to be available to listen to children when they needed to ask an academic question or when they needed to talk about a personal matter. Several teachers reported that the aide often did most of the listening, while the teacher did most of the instruction. Other teachers reported that they were able to provide more individual attention to interpersonal relations among children in the class, and more individual attention to solve discipline problems.

Several general explanations were given for how the aide allowed more individual attention. One of the most common was that the aide monitored and supervised the class while the teacher gave individual attention (There are fewer discipline problems because of the aide so I can work with an individual child without the class cutting up."). As has been explained in previous questions, teachers had time to provide individual attention to their

pupils because the aide was taking care of administrative, clerical, and non-teaching tasks.

DIFFERENCES IN CLASSROOM SOCIAL CLIMATE

Teachers were asked: "If the social climate in your classroom has been different this year as compared to last year, then describe how it has been different." Responses were probed regarding effect on instruction and learning, teacher knowledge of individual children, interpersonal relations between teacher and children, and interpersonal relations among children.

Small Class Teachers and Classroom Social Climate

Small class teachers reported there was a strong sense of unity in the classroom. Teachers reported that small class children knew each other well (many had been together since kindergarten) and were highly supportive of each other. They were strongly positive about the social climate of the classroom. Teachers noted that the classroom climate was informal and relaxed. As was the case with kindergarten and first grade teachers, many of the second grade Project STAR teachers described their small classes as feeling close, like a family. They described a family climate in the classroom, noting that children were aware of each others strengths and weaknesses. Several teachers noted that peer tutoring was particularly effective because of the warm, tolerant, and supportive social relations among children in the class. Several teachers reported there was less physical aggression among children. Teachers reported that they were more open about themselves with the children in their classes; explained one teacher "I've related more about myself and my family to my class then ever before." In some cases this more relaxed and informal atmosphere resulted in the teacher allowing children more freedom to move around the classroom. For example, one teacher explained, "It's almost like a snowy day with a large class when half of the class is absent. The kids have been that way all of the year." Similarly, several small class teachers reported that the feeling of closeness extended to their interactions with parents of the children in their class.

In contrast, some teachers perceived the high degree of cohesion to be a problem, noting that they did not socialize well with other children in the school, and tended to hold themselves apart from the other children. Similarly, some teachers noted that children bickered amongst themselves, and like siblings were often jealous of attention from the teacher. Some teachers reported that cliques had formed within the class, and that these were counterproductive to positive group relations. Teachers attributed these problems to the fact that the children in these small classes had been together since kindergarten.

An interesting concern was expressed by several teachers who noted that because these children are accustomed to a great deal of individual attention from teachers, it is more difficult to get them to work independently. These teachers noted that children are accustomed to being able to get immediate feedback from the teacher, and are too dependent on the teacher.

Regular/Aide Class Teachers and Classroom Social Climate

Most regular/aide class teachers reported that there had been positive differences in the social climate of their classroom this year. Most teachers attributed these differences to the presence of a full time aide. The primary reason for these positive differences revolved around teachers feeling as if they had more time. The aide was seen as the primary reason for more time. Teachers described that they felt less pressure during the day, that they were more at ease and more comfortable. One teacher explained it in this fashion: "Ordinarily I run a pretty tight ship. This year the atmosphere has been more relaxed because the aide can help control the class. I get to know the kids better because I don't have to be mean all of the time. We allow more interaction between kids without the class getting out of hand." Or, as another teacher explained, "Because of the aide I could relax instead of being on guard all of the time."

Improved parent relations was mentioned by several teachers as contributing to their feeling of a more positive social climate in the classroom. The aide often contributed to these changes because the aides tended to live in the immediate school neighborhood, whereas teachers often did not, particularly in urban and inner city areas. In that regard the aides were sometimes able to provide the teacher with information about pupil families, and this information enabled the teacher to better understand and work with the pupil. Similarly, some teachers reported that children often felt more comfortable talking to the aide about a problem than the teacher.

Several general explanations were given for how the aide contributed to a more positive social climate in the classroom. As has been explained in previous questions, teachers had time to provide individual attention to their pupils because the aide was taking care of administrative, clerical, and non-teaching tasks.

DIFFERENCES IN DEMANDS ON AVAILABLE TIME

Teachers were asked: "If the demands on your available time have been different this year as compared to last year, then describe how they have been different."

Small Class Teachers and Demands on Available Time

The overwhelming response from most small class teachers was that they had more time at school and more time at home than they had in the past. MAny teachers responded to this question in terms of job satisfaction. Several teachers noted that they rarely had to take papers home to grade, resulting in much less stress on their family life. For example, one teacher reported, "I've felt more like a person at home and a teacher at school." Another described that she had more planning time and could stay ahead, resulting in more time for her family at home. Several teachers spoke about reduced feelings of stress, tension, and frustration associated with their job. Reported another teacher, "Mentally this has been a better year for me, my husband says I've been a lot easier to get along with. . . and I don't sit

and grade papers all night or get so moody." In contrast, several teachers reported spending extra time at home on things like teaching notes, parent notes, progress reports, enrichment activities, and brainstorming for teaching plans. Other teachers reported more time for planning and organization at school.

Several teachers noted that they had to work harder and spend more time to prepare challenging materials for the many academically advanced children in their classes. Noted one small class teacher in a detailed response to this question:

> "This has been one of the best years. It has not been one of the easiest. The better you know your students, the more you see what needs to be done. I think I have worked harder than I ever have. The results are not necessarily going to show up on the achievement test scores. But I think I have made some positive strides in improving some student's self-esteem and fostering in some students the desire for knowledge. I think I have helped some students realize that learning can be fun. We have cut, and measured, and weighed pumpkins, made cookies, made necklaces from dough we made, cut and colored a life-size model of Abraham Lincoln, written a lot of stories, drawn a lot of pictures, and just in general had a lot of fun. Almost every week has brought some new project to look forward to. I have used the extra time available to me to search through professional materials for new ideas. I think every student in this class is going to leave here at the end of the year with some positive memories and as far as I am concerned, that's progress."

Regular/Aide Class Teachers and Demands on Available Time

Most regular/class teachers reported differences between the demands on their time this year as compared with past years. Most explained these differences in relation to the presence of a full time aide in the classroom. Many teachers indicated that they spent less time grading papers, preparing teaching materials, engaged in clerical tasks, and performing non-teaching tasks. Teachers felt that this resulted in less pressure and less stress. Many teachers reported positive effects on their life outside of school. Noted one teacher, "I have time to reflect on what was done and what needs to be done instead of grading papers until 10:00 or 10:30 pm." Noted another, "The aide has given me more time at home and at school." Simply stated, many teachers explained, it just takes two people less time to do the work. Other teachers reported that the presence of the aide allowed them time for more thoughtful planning and allowed them to do more planning at school rather than at home.

USE OF THE FULL-TIME TEACHER AIDE

Regular/aide class teachers were asked: "If you had to choose one way or the other, would you describe your use of the full-time teacher's aide as primarily a clerical assistant, or primarily an instructional assistant." They were also asked to describe tasks the aide performed on a regular basis, and to describe tasks that are only the teacher's responsibility.

Twelve regular/aide class teachers described their use of the full time aide primarily as an instructional assistant. As did most teachers in the sample, they explained that the instructional tasks that are only the teacher's responsibility consisted of planning lessons, and introducing and presenting (initial teaching of all) new material. These teachers reported that they were responsible for explaining the morning seatwork assignments to the class. Most also reported that they were primarily responsible for testing and grading. These descriptions of duties which were only the teacher's responsibility were extremely consistent across all regular/aide class teachers.

The aide was described as helping with writing, math problems, and extra reading by working with small groups and individuals. Some of these teachers reported using their aide for reinforcing material that had already been taught, and reteaching (tutoring) material that children were having problems with. Some of these teachers used the aide to help students with make-up work when they had been absent. Even though they described the use of their aide primarily as instructional, most of these teachers reported that the aide took care of non-teaching tasks, paperwork, materials preparation, and grading. Several teachers commented that they took responsibility for grading papers that were used to compute grades recorded on report cards. There appeared to be a distinction between checking or marking papers and grading papers. Aides seemed to be utilized for checking while teachers took responsibility for grading. Most of these teachers also reported that the aide assisted by monitoring the classroom.

Seven regular/aide class teachers declined to describe the use of their full time aide as either primarily instructional or clerical. Their description of the use of the aide was almost identical to that provided by teachers who reported using their aide primarily as an instructional assistant.

There were 52 regular/aide class teachers who described their use of the full time aide primarily as a clerical assistant. These teachers appeared to use their aide in the same fashion as those who reported using their aide primarily as an instructional assistant. These teachers reported using the aide for one-on-one tutoring, small group remedial teaching, drill work with math and spelling, monitoring pupil behavior while the teacher worked with reading groups, supervising students engaged in independent activities and learning centers, checking student papers, collecting money, taking attendance, non-teaching and administrative tasks. As a group the regular/aide class

teachers generally took responsibility for all whole group instruction and most small group instruction. Occasionally teachers reported that they allowed the aide to engage in initial presentation of new content to children in a reading group, primarily the lowest achieving group.

Summary of Second Grade Teacher Exit Interviews

The primary purpose of the 1988 second grade Teacher Exit Interviews was to elicit descriptions of differences, if any, that teachers perceived regarding the following dimensions: (a) amount of content covered, (b) amount of instructional time on task, (c) monitoring student work, (d) ability to match level of instruction to the ability of individual pupils, (e) pacing of instruction, (f) degree of active student-teacher academic interaction, (g) individual attention to students, (h) classroom social climate, (i) demands on available teacher time, and (j) use of full time teacher aide. These ten dimensions emerged from 1986 exit interviews with teachers (Achilles, et al, 1988), 1987 exit interviews with Project STAR first grade teachers (Johnston, 1988), and instruction research literature.

Amount of content covered. Both Small class and Regular/Aide class teachers overwhelmingly expressed the perception that they had covered more content than in past years, offering evidence such as completing, for the first time, all of the required second grade reading books. Moreover, they described how they had been able to cover the required material in more depth than in the past. These two groups of teachers also reported that pupils had more opportunities to learn content through means such as increased use of enrichment activities suggested by the textbook authors; use of instruction time for such "non-basic skill" subjects as social studies, science, and the arts; and, increased use of age appropriate hands-on activities and group projects.

When asked to explain how they were able to cover more content than they had in the past, Small and Regular/Aide class teachers described how they were able to give more individual attention to pupils, how they were able to provide more immediate feedback regarding pupil performance, how they were able to give more individualized feedback, and how this feedback resulted in increased opportunity for more immediate, individualized remedial teaching.

Amount of instructional time on task. Both Small class and Regular/Aide class teacher responses to this questions were similar to their comments regarding amount of material covered. Teachers in both groups reported that they were able to provide more individual attention to each pupil; and that children were more likely to be on task during work periods because of increased teacher "withitness" resulting from having to monitor fewer children or having two adults to share monitoring duties.

Regular/Aide class teachers perceived they were able to spend more instructional time on task with their pupils because the aide assisted with children during seatwork periods, and performed time-consuming grading and clerical functions.

Monitoring student work. Teachers described a number of differences in how they monitored pupil work in Small and Regular/Aide classes. Generally they described monitoring as easier, explaining that they were able to provide on the spot checking and feedback so that monitoring and reteaching were almost simultaneous. Smaller classes allowed flexible formation of ad hoc groups formed on the basis of a particular instructional needs. Some small class teachers also explained that their more individualized and more accessible knowledge of each child's performance level provided an improved basis for matching instruction to the needs of both high and low achievers.

Ability to match level of instruction to the ability of individual pupils. In general small class teachers indicated that it was much easier to match the level of their instruction to the level of the student's ability. Their explanations for why this was easier related to having more detailed and accessible knowledge of pupil ability levels, and to having the time to provide immediate, individual attention to students, particularly at remedial and enrichment levels. Regular/Aide class teachers explained how the aide worked with temporary groups of children having similar problems in basic skill areas; how the aide helped provision and supervise learning centers and project activities; and how the aide functioned as a roving tutor/monitor during seatwork periods.

Pacing of instruction. Both Small and Regular/Aide class teachers perceived that the pace of instruction had been faster this year than in past years. They attributed this difference to more time for individual attention, and greater ease in keeping slower students up with the rest of the class. While both groups of teachers described pacing not only as more efficient in terms of covering required basic skills and knowledge, but also in terms of greater opportunity for indepth coverage. They perceived there was greater opportunity to "stop and smell the roses along the way." Pacing was also described as more efficient in relation to a more relaxed pace of classroom life, brought about by the knowledge that they would not only accomplish what they had to, but that they also would have time for more developmentally appropriate (Bredekamp, 1987) instructional approaches and learning activities associated with the content and skills being taught.

Degree of active student-teacher academic interaction. Small class teachers reported more frequent academic interaction with individual students than in the past. They addressed increased levels of academic engagement, more frequent opportunities for responses in class, and higher levels of individual attention to each child's academic progress. They saw these changes as the result of increased available time.

Regular/Aide class teachers noted higher levels of academic interaction resulting from increased individual attention made possible by having two adults in the classroom. Possibilities for small group instruction and one-to-one tutoring increased as a result of the full-time aide's presence in the classroom. Regular/Aide class teachers also perceived these changes to be the result of more available time.

Increased individual attention. Increased individual attention was a major, salient theme throughout Small class teacher responses to most interview questions. Small class teachers perceived that there was more time to converse with students; that they had a better knowledge of students' personal and home lives; and that they had more time to attend to the individual learning needs of children in their classes. Regular/Aide class teachers were overwhelming in their response that there had been more individual attention to pupils as compared to past years. The presence of two adults in the classroom meant that children could receive more attention regarding both academic and personal matters. Both Small and Regular/Aide class teachers explained that the increased individual attention to students resulted from more available time.

Classroom social climate. As in past years, Small class teachers generally described their classes as supportive, family-like, cooperative, and relatively informal. For the most part they were strongly positive about the social climate of the classroom. In contrast, a few Small class teachers reported jealousy and classroom cliques in small size classes where the children had been together since kindergarten. A few Small class teachers reported that children in their class appeared to be highly dependent on immediate attention from the teacher, and that they had problems working independently. Regular/Aide classes also reported positive differences in classroom social climate. These teachers perceived that the presence of the full-time aide resulted in a more relaxed classroom atmosphere. These teachers also perceived improved parent-teacher relations resulting from the presence of an aide who lived in the school community.

Demands on available time. Both Small class and Regular/Aide class teachers as a group shared the perception that they had more time at school and at home. Both groups felt less pressured at work during the day and at home in the evening. Small class teachers expressed these perceptions in relation to having fewer students requiring their attention; while the Regular/Aide class teachers perceived that the full-time aide relieved considerable pressure by grading papers and preparing instructional materials. Both Small and Regular/Aide class teachers expressed improved work attitudes, and the perception of less job associated stress. Some Small class teachers reported spending more time meeting the challenge of their relatively advanced and fast moving small class, but noted this as a positive feature.

Use of full-time aides. Most Regular/Aide class teachers perceived their aide

primarily as a clerical assistant rather than as an instructional assistant. However, regardless of how teachers perceived their full-time aide, there was little difference in how they made use of the aide in the classroom. Regular/Aide class teachers clearly indicated that they themselves were responsible for initial instruction of new content both in small group as well as whole class instructional episodes. The teacher aides were then used for drill work with small groups, one-on-one tutoring, and monitoring pupil behavior. The full-time teacher aides were generally used for clerical functions including checking student papers, collecting money, taking attendance and other non-instructional tasks.

Conclusion

Education at all levels is coming under scrutiny and criticism from professional and citizen groups in our society. For example, areas of concern recently identified include low student achievement test scores in reading and math, lack of knowledge about geography, literature, current events, poor skills in writing, failure, and retention to name but a few. One response to these and other concerns already taken by some school systems and being considered by others is reduction of class size, or reduction of teacher-pupil ratio through use of full time teacher aides.

Tomlinson asserts in the 1988 position paper, *Class size and public policy: Politics and Panaceas*, that there is not sufficient evidence to support a policy of limiting class size in order to improve the quality of worklife for teachers. The Project STAR second grade teacher interview data, along with kindergarten and first grade teacher interview data, clearly challenge the accuracy of this assertion. More specifically however, detailed analysis of almost a thousand Project STAR teacher interviews revealed distinct and consistent perceptions and explanations clearly illustrating how having fewer children, or a second adult assistant always present in the classroom contributed to significant improvements in the quality of teachers' worklife, the classroom learning environment, and the quality of experiences children encountered in schools.

Teachers were clearly more relaxed, more flexible, more likely to engage in creative teaching episodes, more open to interactions with children, less authoritarian, and felt less pressed by time. Children were perceived to be more supportive, more cooperative, and more productive. Children received more immediate feedback, competed less for the teacher's attention, and spent less time waiting. Classroom density was reduced, resulting in more flexible arrangement and use of physical space. More talking between children was permitted and higher noise levels were tolerated.

The question of optimal class size has been extensively studied from the perspective of pupil outcomes, usually in the form of achievement tests. However, the dynamics of teaching and learning in classrooms when class size is reduced or when teacher/pupil ratio is reduced is not well understood. Teachers' explanations of how their teaching is different with fewer students or with a full time aide can provide an important perspective from which to consider the issue of optimal class size.

Optimal class size and use of teacher aides is an important educational and social policy issue being debated at local, state and national levels (Shanker, 1986; Swan, Stone, & Gillman, 1987; Tomlinson, 1988). Unfortunately the current debate focuses primarily on pupil achievement. The Project STAR interview data, based on a large sample of teachers in inner-city, urban, suburban, and rural school settings, suggest that reduction in class size and teacher-pupil ratio has a strong positive impact on the workplace of teachers and the learning environment and experiences of students.

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